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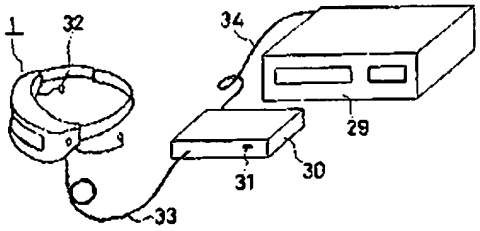
(54)【考案の名称】　映像表示システム

(57)【要約】

【目的】　シースルー型ＦＭＤを外部装置から強制的にシースルーオンにしたり、強制的に特定の電子像を表示したりする。

【構成】　観察者は第１制御装置３０のシースルーボタン３１によりＦＭＤ１をシースルーオフとし、第１制御装置３０を操作して所望の電子像を観察することができ、またシースルーオンとして外界像を観察することもできる。第２制御装置２９は映像信号、シースルー制御信号等を供給するものであり、シースルーオンを示すシースルー制御信号が送信された場合には第１制御装置３０のシースルーボタン３１は無効となされ、ＦＭＤ１は強制的にシースルーオンとなされる。また、特定のチャンネルに所定の映像信号が供給された場合には、第１制御装置３０は当該特定のチャンネルに切り換えると共に、音量を所定の大きさに設定する。これによって、ＦＭＤ１を使用している観察者全員に対して、所定の電子像を所定の音量で観察させることができる。



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【実用新案登録請求の範囲】

【請求項1】少なくとも、映像を表示する映像表示素子と、前記映像表示素子に表示される映像を観察者の眼球に投影する光学系とを備えた映像表示装置と、

前記映像表示装置と一体または別体に設けられ、前記観察者の眼球に導く像を切り換える像切り換え手段と、

前記映像表示装置と一体または別体に設けられ、前記像切り換え手段を制御する第一の信号が出力可能となされた第一の像切り換え手段制御装置と、

前記映像表示装置とは別体に設けられ、前記像切り換え手段を制御する第二の信号が出力可能となされた第二の像切り換え手段制御装置とを備え、

前記第一の信号によらず強制的に前記第二の信号により前記像切り換え手段を制御することができることを特徴とする映像表示システム。

【請求項2】前記像切り換え手段が、前記観察者の眼球へ導かれる外界像の誘導／遮断を切り換える外界像切り換え手段であることを特徴とする請求項1記載の映像表示システム。

【請求項3】前記像切り換え手段が、前記映像表示素子に表示される映像を切り換える映像切り換え手段であることを特徴とする請求項1記載の映像表示システム。

【図面の簡単な説明】

【図1】本考案の第1の実施例の構成を示す図である。

【図2】第1の実施例で用いられるシースルー制御信号の形態の例を示す図である。

【図3】FMDに設けられる液晶シャッタ制御装置の構成例を示す図である。

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＊【図4】本考案の第2の実施例の構成を示す図である。

【図5】第2の実施例で用いられるシースルー制御信号の形態の例を示す図である。

【図6】第2の実施例で用いられる液晶シャッタ制御装置の構成例を示す図である。

【図7】本考案の第3の実施例の構成を示す図である。

【図8】本考案の第4の実施例の構成を示す図である。

【図9】シースルー型FMDの光学系の構成例を示す図である。

【図10】シースルーFMDの全体の外観の例を示す図である。

【符号の説明】

1…シースルー型FMD本体

2．31…シースルーボタン

10…液晶シャッタ

11…映像表示素子

14．15…レンズ

16…凹面ハーフミラー

20．25…映像供給ユニット

21．33、34、38．39、40…ケーブル

22…コネクタ

23．27…シースルー制御信号検知回路

24．28…液晶シャッタ制御回路

26．27…アンテナ

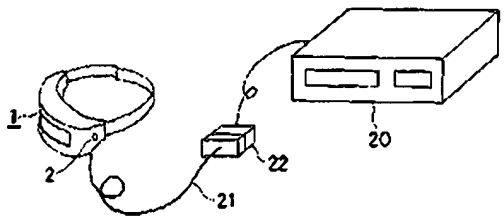
29．35…第2制御装置

30．36…第1制御装置

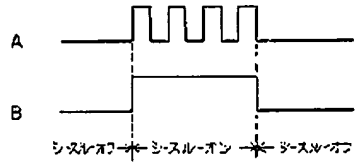
32…イヤホン

37…切り換え装置

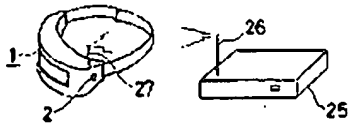
【図1】



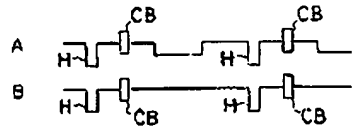
【図2】



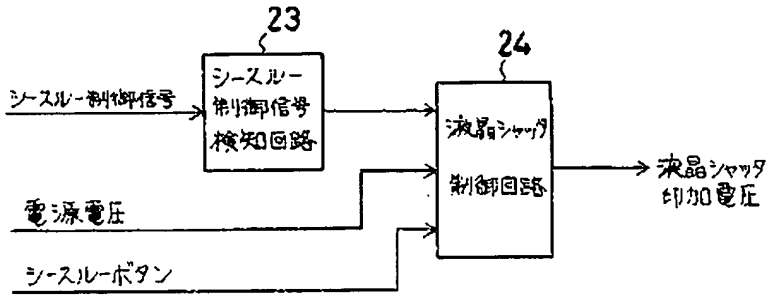
【図4】



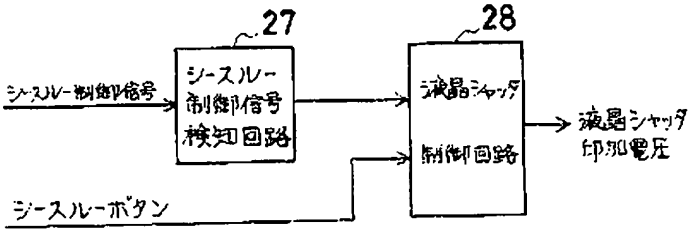
【図5】



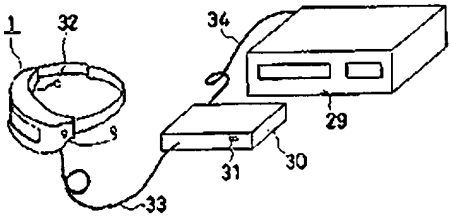
【図3】



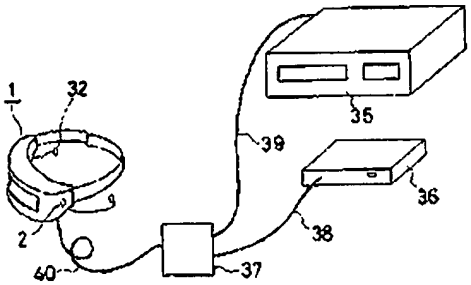
【図6】



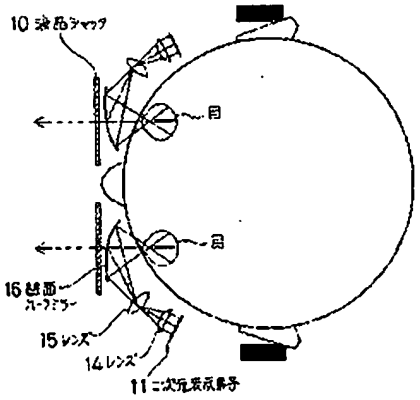
【図7】



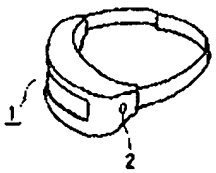
【図8】



【図9】



【図10】



【考案の詳細な説明】

【０００１】

【産業上の利用分野】

本考案は、顔面装着型映像表示装置（Face Mounted Display：以下、ＦＭＤと称す）を用いた映像表示システムに係り、特に、電子像の観察と外界像の観察とを切り換えることができる映像表示システムに関する。

【０００２】

【従来の技術】

従来、電子像の観察ばかりでなく、外界像の観察をも行うことができるシースルー型ＦＭＤが知られている（例えば、特開平２－２８１８９１号公報、特開平４－２６２８９号公報参照）。

【０００３】

図９にシースルー型ＦＭＤの光学系の構成例を示す。図９においては、視野外に配置した二次元の映像表示素子１１の電子像からの表示光をレンズ１４、１５を介して目の前方に配置した凹面ハーフミラー１６へ入射させる。これにより、電子像は凹面ハーフミラー１６で反射拡大されて目に導かれる。また、凹面ハーフミラー１６の前方には液晶シャッタ１０が配置されている。従って、液晶シャッタ１０を遮光状態にすれば電子像を観察することができ、透過状態にすれば外界像を観察することができる。なお、液晶シャッタ１０としては、電圧印加時に遮光状態になるポジタイプと、電圧印加時に透過状態となるネガタイプがあるが、どちらのタイプを使用してもよいものである。

【０００４】

図１０はシースルーＦＭＤの全体の外観の例を示す図であり、ＦＭＤ本体１の所定の位置、図では左側面には液晶シャッタ１０の透過状態と遮光状態とを切り換えるためのシースルーボタン２が設けられている。

【０００５】

そして、このようなシースルー型ＦＭＤは、航空機等の旅客手段においては利用客の娯楽のために利用されており、また、教育の分野等においても利用され始めている。

【0006】

【考案が解決しようとする課題】

しかしながら、従来のシースルー型ＦＭＤを用いた映像表示システムにおいては、液晶シャッタを透過状態にするか、遮光状態にするかの制御は観察者しか行えなかったので次のような問題があった。

【0007】

例えば、シースルー型ＦＭＤを用いる映像表示システムが旅客機に利用される場合を考えると、離陸時には電子像を観察している観察者に対して、これから離陸する旨を知らせる必要があるので、例えば「離陸しますので、シートベルトをお締め下さい」等の電子像を強制的に表示することが望まれる。着陸時についても同様である。また、緊急を要する事態が発生した場合には電子像を観察している観察者に対して当該緊急事態に適切に対処させるために、外界像を観察させる必要が生じる。

【0008】

また、シースルー型ＦＭＤを用いる映像表示システムが教育の場に利用される場合を考えると、受講者全員を黒板等に注目させる必要が生じることがあり、このような場合にはシースルー型ＦＭＤの液晶シャッタを強制的に透過状態にする必要がある。更に、受講者全員に対して何等かの問題を与えることもあり、このような場合には、全員に対して強制的に問題の電子像を観察させる必要がある。

【0009】

このように、シースルー型ＦＭＤを用いた映像表示システムを公共の場に適用する場合、あるいは複数人で使用する場合には、その監督者等の権限を有する者が全ての観察者に強制的に外界像を観察させたり、あるいは強制的に所定の電子像を観察させたりする必要が生じるのであるが、従来のシースルー型ＦＭＤにおいては液晶シャッタを透過状態にするか、遮光状態にするかの選択は観察者しかできなかったので、上記のような要望に応えることはできないものである。

【0010】

本考案は、上記の課題を解決するものであって、シースルー型ＦＭＤを用いる映像表示システムにおいて、シースルー型ＦＭＤを使用している観察者以外の第

三者が、観察者に対して強制的に所定の電子像を観察させたり、あるいは観察者に対して強制的に外界像を観察させたりすることができる映像表示システムを提供することを目的とするものである。

【0011】

【課題を解決するための手段】

上記の目的を達成するために、本考案の映像表示システムは、少なくとも、映像を表示する映像表示素子と、前記映像表示素子に表示される映像を観察者の眼球に投影する光学系とを備えた映像表示装置と、前記映像表示装置と一体または別体に設けられ、前記観察者の眼球に導く像を切り換える像切り換え手段と、前記映像表示装置と一体または別体に設けられ、前記像切り換え手段を制御する第一の信号が出力可能となされた第一の像切り換え手段制御装置と、前記映像表示装置とは別体に設けられ、前記像切り換え手段を制御する第二の信号が出力可能となされた第二の像切り換え手段制御装置とを備え、前記第一の信号によらず強制的に前記第二の信号により前記像切り換え手段を制御することができることを特徴とする。

【0012】

ここで、前記像切り換え手段は、請求項2記載のように、前記観察者の眼球へ導かれる外界像の誘導／遮断を切り換える外界像切り換え手段であってもよいし、また、請求項3記載のように前記映像表示素子に表示される映像を切り換える映像切り換え手段であってもよい。

【0013】

【作用】

第一の像切り換え手段制御装置は映像表示装置の所定の位置に設けられていてもよく、また映像表示装置とは別体に設けられていてもよいが、この第1の像切り換え手段制御装置が操作されると像切り換え手段が制御され、これによって観察する像が切り換わる。ここで、像は、電子像ばかりではなく、外界像をも含め、これらを総称するものである。従って、観察者は、この第一の像切り換え手段制御装置を操作することによって、外界像を観察することもできるし、所望の電子像を観察することもできる。

【００１４】

更に、本考案の映像表示システムは第二の像切り換え手段制御装置を備える。この第二の像切り換え手段制御装置は映像表示装置とは別体になされており、像切り換え手段を強制的に制御することができるものである。従って、この第二の像切り換え手段制御装置を操作することによって、観察者に対して強制的に外界像を観察させるようにすることもできるし、また所定の電子像を観察させるようにすることもできる。

【００１５】

【実施例】

以下、図面を参照しつつ実施例を説明する。なお、以下の実施例においては、シースルー型ＦＭＤの液晶シャッタを透過状態とすることをシースルーオンといい、液晶シャッタを遮光状態とすることをシースルーオフという。

【００１６】

図１は本考案に係る映像表示システムの第１の実施例の構成を示す図である。この実施例は、シースルーのオン／オフ制御、即ちシースルー型ＦＭＤ本体１（以下、単にＦＭＤと称す）の液晶シャッタを透過状態にするか、遮光状態にするかの制御を映像供給ユニット２０で行えるようにした構成例を示す図である。

【００１７】

図１において、ＦＭＤ１はケーブル２１により映像供給ユニット２０と接続されており、映像供給ユニット２０からＦＭＤ１に対して映像信号、電源、シースルー制御信号等が供給される。なお、２２はコネクタを示す。また、図１においては映像供給ユニット２０にはシースルー型ＦＭＤ１が一つだけ接続されているが、複数個されてもよいことは当然である。

【００１８】

ＦＭＤ１にはシースルーボタン２が配置されており、観察者は従来と同様に、このシースルーボタン２を操作し、シースルーオフにすれば映像供給ユニット２０から供給される電子像を観察することができ、またシースルーオンにすれば外界像を観察することができる。

【００１９】

図示してはいないが、映像供給ユニット２０にはＦＭＤ１をシースルーオンとするかシースルーオフとするかを設定できるスイッチが備えられており、当該スイッチによりシースルーオンにすると、シースルー制御信号がＦＭＤ１に供給される。そして、映像供給ユニット２０からのシースルー制御信号がシースルーオフを示す場合には、ＦＭＤ１側において観察者がシースルーボタン２を操作することによってシースルーオン／オフの制御が可能であるが、映像供給ユニット２０からのシースルー制御信号がシースルーオンを示す場合には、ＦＭＤ１は強制的にシースルーオンとなされ、シースルーボタン２を操作してもシースルーオフにすることはできないようになされている。

【００２０】

従って、映像供給ユニット２０を操作するオペレータが当該スイッチを操作することによって、全てのＦＭＤ１をシースルーオンにすることができ、これによって観察者全員に外界像を観察させることができる。

【００２１】

また、ＦＭＤ１は、映像供給ユニット２０から電源が供給されない場合にもシースルーオンとなるようになされている。

【００２２】

ここで、シースルー制御信号の形態は任意であるが、例えば図２Ａに示すように、シースルーオフの場合にはローレベルの信号、シースルーオンの場合には所定の周波数のクロック信号とすることもできるし、また図２Ｂに示すように、シースルーオフの場合にはローレベルの信号、シースルーオンの場合にはハイレベル信号とすることもできる。

【００２３】

このようなシースルーのオン／オフ制御は、シースルー型ＦＭＤ１に液晶シャッタの透過状態／遮光状態を制御するものとして、例えば図３に示すような液晶シャッタ制御装置を設けることによって行うことができる。図３において、シースルー制御信号検知回路２３は、映像供給ユニット２０からのシースルー制御信号を検知し、シースルーオンである場合には所定のレベル、例えばハイレベルの信号を出力し、シースルーオフである場合には他の所定のレベル、例えばローレ

ベルを出力するものであり、シースルー制御信号が図２Ａに示すものである場合にはクロック信号の周波数を検知する回路等で構成することができ、またシースルー制御信号が図２Ｂに示すものである場合にはレベル検出回路等で構成することができる。

【００２４】

このシースルー制御信号検知回路２３の出力は液晶シャッタ制御回路２４に入力されるが、液晶シャッタ制御回路２４には、また映像供給ユニット２０から供給される電源電圧及びシースルーボタン２からの信号が入力される。そして、液晶シャッタ制御回路２４は、電源電圧を検知し、電源電圧が正常な値である場合においてシースルー制御信号検知回路２３の出力がローレベルであるときには、シースルーボタン２からの信号を有効とし、シースルーボタン２でシースルーオンとなされた場合には所定の電圧を液晶シャッタに印加し、シースルーオフとなされた場合には他の所定の電圧を印加する。例えば、いま、液晶シャッタとしてポジタイプのものを使用するものとすると、液晶シャッタ制御回路２４は、シースルーオンの場合には０Ｖを印加し、シースルーオフの場合には０Ｖでない所定の電圧を印加する。

【００２５】

また、液晶シャッタ制御回路２４は、電源電圧が正常な値である場合においてシースルー制御信号検知回路２３の出力がハイレベルであるときには、シースルーボタン２からの信号を無視し、液晶シャッタには透過状態とする電圧を印加する。

【００２６】

更に、液晶シャッタ制御回路２４は、電源電圧のレベルを検知し、電源電圧が供給されていない場合には、シースルー制御信号検知回路２３の出力及びシースルーボタン２からの信号を無視して、液晶シャッタには透過状態とする電圧を印加する。

以上の構成により、映像供給ユニット２０を操作することにより、外部から強制的にＦＭＤ１をシースルーオンとすることができる。

【００２７】

次に、第２の実施例について説明する。

図４は本考案の第２の実施例の構成を示す図であり、映像供給ユニット２５は映像信号及びシースルー制御信号等を供給するものであるが、これらの信号はアンテナ２６から無線により送信される。ＦＭＤ１側では無線送信された信号をアンテナ２７で受信する。

【００２８】

シースルー制御信号は、図２Ａ、Ｂに示すような信号を所定の周波数で無線送信してもよいことは当然であるが、ここでは図５Ａ、Ｂに示すように、シースルーオンとシースルーオフとで映像信号の垂直帰線期間の所定の水平期間のレベルを異ならせるようにしている。なお、図５において、Ｈは水平同期信号、ＣＢはカラーバースト信号を示す。

【００２９】

従って、ＦＭＤ１には例えば図６に示すような液晶シャッタ制御装置を設けることによって、映像供給ユニット２５を操作することにより、外部から強制的にＦＭＤ１をシースルーオンとし、観察者に外界像を観察させることができる。

【００３０】

図６において、シースルー制御信号検知回路２７は、受信した映像信号の垂直帰線期間の所定の水平期間をサンプリングし、そのレベルを検知して、シースルーオンを示すものか、シースルーオフを示すものかを判断し、シースルーオンである場合には所定のレベル、例えばハイレベルの信号を出力し、シースルーオフである場合には他の所定のレベル、例えばローレベルを出力する。

【００３１】

このシースルー制御信号検知回路２７の出力は液晶シャッタ制御回路２８に入力されるが、液晶シャッタ制御回路２８には、シースルーボタン２からの信号が入力される。そして、液晶シャッタ制御回路２８は、シースルー制御信号検知回路２７の出力がローレベルであるときには、シースルーボタン２からの信号を有効とし、シースルーボタン２でシースルーオンとなされた場合には液晶シャッタに対して透過状態とする電圧を印加し、シースルーオフとなされた場合には遮光状態とする電圧を印加する。

【００３２】

また、液晶シャッタ制御回路２８は、シースルー制御信号検知回路２７の出力がハイレベルであるときには、シースルーボタン２からの信号を無視し、液晶シャッタには透過状態とする電圧を印加する。

【００３３】

次に、本考案の第３の実施例について説明する。

図７は本考案の第３の実施例の構成を示す図であり、ＦＭＤ１、第１制御装置３０、第２制御装置２９を備えており、ＦＭＤ１と第１制御装置３０はケーブル３３で接続され、第１制御装置３０と第２制御装置２９はケーブル３４で接続されている。

【００３４】

第１制御装置３０はＦＭＤ１を使用する観察者の手元に配置されるものであり、シースルーボタン３１及び図７には図示しないが音量調整手段、電子像の番組を切り換えるためのチャンネル切り換え手段等を備えている。

【００３５】

従って、観察者は、シースルーボタン３１によりＦＭＤ１をシースルーオフとし、第１制御装置３０を操作して所望の電子像を観察し、イヤホン３２により所望の音量で当該電子像の音声を聞くことができる。また、シースルーボタン３１によりシースルーオンとすることによって外界像を観察することができる。

【００３６】

第２制御装置２９は、種々の映像信号、シースルー制御信号等を供給すると共に、第１制御装置３０を制御するものであり、観察者以外の所定のオペレータにより操作される。

【００３７】

そして、図７には図示しないが、第２制御装置２９にはＦＭＤ１のシースルーのオン／オフを制御するためのシースルー制御信号を送信するためのスイッチ（以下、第１スイッチという）及びＦＭＤ１に強制的に所定の電子像を供給するようにするためのスイッチ（以下、第２スイッチという）が備えられており、第２制御装置２９の第１スイッチが操作されてシースルーオンを示すシースルー制御

信号が送信されると、第１制御装置３０のシースルーボタン３１は無効となされ、ＦＭＤ１は強制的にシースルーオンとなされる。このときのシースルー制御信号は図２Ａまたは図２Ｂのようであってよく、第１制御装置３０には図３に示すと同様な液晶シャッタ制御回路を設ければよい。

【００３８】

また、第２制御装置２９の第２スイッチが操作されると特定のチャンネルに所定の映像信号が供給されると共に、所定の制御信号が送信される。第１制御装置３０はこの制御信号を検知すると、当該特定のチャンネルに切り換えると共に、音量を所定の大きさに設定する。これによって、ＦＭＤ１を使用している観察者全員に対して、所定の電子像を所定の音量で観察させることができる。このような制御を行うには、第１制御装置３０に当該制御信号を検知する検知回路及び検知回路の出力に基づいてチャンネル切り換えを行う切り換え回路を備えればよく、このような回路は周知であるので詳細な説明は省略する。

【００３９】

なお、上記の構成によれば、ＦＭＤ１がシースルーオフになされている場合には強制的に所定の電子像を観察させることができるが、ＦＭＤ１がシースルーオンになされている場合には当該電子像を観察させることはできない。そこで、第２スイッチが操作されたときに送信される所定の制御信号を検出し、それに基づいてＦＭＤ１を強制的にシースルーオフにする制御装置を第１制御装置３０に設けてもよいものである。このような制御装置は図３に示すと同様に構成することができることは当業者に明かである。

【００４０】

次に、本考案の第４の実施例について説明する。

図８は本考案の第４の実施例の構成を示す図であり、ＦＭＤ１、第１制御装置３６、第２制御装置３５及び切り換え装置３７を備えており、ＦＭＤ１と切り換え装置３７とはケーブル４０で接続され、切り換え装置３７と第１制御装置３６、第２制御装置３５とはそれぞれケーブル３８，３９で接続されている。

【００４１】

第１制御装置３６は種々の映像信号を供給するものであり、第２制御装置３５

は特定の映像信号及びシースルー制御信号をはじめとする制御信号等を供給するものである。また、切り換え装置３７はＦＭＤ１に対して第１制御装置３６から供給するか、第２制御装置３５から供給するかを選択するためのものであり、観察者以外の所定のオペレータにより操作される。

【００４２】

切り換え装置３７は、通常は、第１制御装置３６を選択するようになされている。従って、観察者は、シースルーボタン２によりＦＭＤ１をシースルーオフとすることによって電子像を観察し、イヤホン３２により当該電子像の音声を聞くことができる。また、シースルーボタン２によりシースルーオンとすることによって外界像を観察することができる。

【００４３】

観察者全員に強制的に特定の電子像を観察させたい場合には、オペレータは第２制御装置３５から当該特定の映像信号を供給すると共に、切り換え装置３７により第２制御装置３５を選択する。これによって、ＦＭＤ１には第２制御装置３５から供給される映像信号による電子像が表示される。なお、このとき、上記第３の実施例に関して述べたと同様に、特定の映像信号と共に所定の制御信号を供給し、ＦＭＤ１を強制的にシースルーオフにしてもよいものである。

【００４４】

また、第２制御装置３５はシースルー制御信号を送出することが可能となされている。従って、オペレータは、第２制御装置３５からシースルー制御信号を送出させると共に、切り換え装置３７により第２制御装置３５を選択する。これによって、全てのＦＭＤ１は強制的にシースルーオンとなされるので、観察者全員に外界像を観察させることができる。

【００４５】

以上、本考案の実施例について説明したが、本考案は上記実施例に限定されるものではなく種々の変形が可能であることは当業者に明かである。

【００４６】

【考案の効果】

以上の説明から明らかなように、本考案によれば、必要に応じて全てのＦＭＤ

をシースルーオンにして観察者全員に外界像を観察させたり、あるいは特定の電子像を観察させることができる。

【公報種別】実用新案法第５５条第２項において準用する特許法第１７条の２の規定による補正の掲載
【部門区分】第７部門第３区分
【発行日】平成１０年（１９９８）９月２５日

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【手続補正書】
【提出日】平成８年１２月２４日
【手続補正１】
【補正対象書類名】明細書
【補正対象項目名】実用新案登録請求の範囲
【補正方法】変更
【補正内容】
【実用新案登録請求の範囲】
【請求項１】　少なくとも、映像を表示する映像表示素子と、前記映像表示素子に表示される映像を観察者の眼球に投影する光学系とを備えた映像表示装置と、
前記映像表示装置と一体または別体に設けられ、前記観察者の眼球に導く像を切り換える像切り換え手段と、
前記映像表示装置と一体または別体に設けられ、前記像切り換え手段と制御する第一の信号が出力可能となされた第一の像切り換え手段制御装置と、
前記映像表示装置とは別体に設けられ、前記像切り換え手段を制御する第二の信号が出力可能となされた第二の像切り換え手段制御装置とを備え、
前記第一の信号によらず強制的に前記第二の信号により前記像切り換え手段を制御することができることを特徴とする映像表示システム。
【請求項２】　前記像切り換え手段が、前記観察者の眼球へ導かれる外界像の誘導／遮断を切り換える外界像切り換え手段であることを特徴とする請求項１記載の映像表示システム。
【請求項３】　前記像切り換え手段が、前記映像表示素子に表示される映像を切り換える映像切り換え手段であることを特徴とする請求項１記載の映像表示システム。
【請求項４】　前記第二の像切り換え手段制御装置が、複数の前記映像表示装置の像切り換え手段を制御することを特徴とする請求項１記載の映像表示システム。
【請求項５】　前記映像表示装置に電源電圧を供給するための電源電圧供給手段と、
前記電源電圧供給手段から供給される電源電圧のレベルを検知するための電源電圧検知手段とを更に有し、
前記電源電圧検知手段により、供給される電源電圧が所定のレベル以下と検知されたときに、所定の像を前記観察者の眼球に導くよう前記像切り換え手段を制御することを特徴とする請求項１記載の映像表示システム。
【請求項６】　音を出力するための音出力手段を更に有する映像表示装置と、
前記音出力手段により音を出力させるために前記映像表示装置に音情報を供給するための音情報供給手段と、
前記音出力手段から出力される音量を所定の大きさに設定するための音量制御信号を出力するための音量制御信号出力手段と、
前記音量制御信号が入力されたときに、前記音情報供給手段から供給される音情報の音量によらず所定の音量にて音を出力するよう音出力手段を制御する音量制御手段とを更に有することを特徴とする請求項１記載の映像表示システム。
【請求項７】　映像を表示する映像表示素子と、前記映像表示素子に表示される映像を観察者の眼球に投影する光学系とを有する複数の顔面装着型映像表示装置と、
前記複数の顔面装着型映像表示装置と別体に設けられ、前記観察者の眼球に導く像を強制的に所定の像に切り換え制御するための強制制御信号を出力するための制御信号出力手段と、
前記強制制御信号が入力されたときに、それまで前記観察者の眼球に導かれていた像から前記所定の像に強制的に切り換え制御するための制御手段と、
を有してなることを特徴とする映像表示システム。

Utility Model JP,06-052288

CLAIMS

[Utility model registration claim]

[Claim 1] The graphic display device equipped with the optical system which projects the image displayed on the graphic display component which displays an image, and said graphic display component at least on an observer's eyeball, The image switch means which switches the image which it is prepared in said graphic display device and one, or another object, and is led to said observer's eyeball, The first image switch means control unit with which the first signal which is formed in said graphic display device and one, or another object, and controls said image switch means was made as an output is possible, With said graphic display device, it is prepared in another object, and has the second image switch means control unit made as an output of the second signal which controls said image switch means is possible. The graphic display system characterized by the ability not to be based on said first signal but control said image switch means by said second signal compulsorily.

[Claim 2] The graphic display system according to claim 1 characterized by being an external world image switch means by which said image switch means switches induction/cutoff of the external world image led to said observer's eyeball.

[Claim 3] The graphic display system according to claim 1 characterized by being an image switch means by which said image switch means switches the image displayed on said graphic display component.

DETAILED DESCRIPTION

[Detailed explanation of a design]

[0001]

[Industrial Application]

This design starts the graphic display system which used the face wearing mold graphic display device (FMD is called below Face Mounted Display;), and is related with the graphic display system which can switch observation of an electronic image and observation of an external world image especially.

[0002]

[Description of the Prior Art]

Conventionally, the see-through mold FMD which can perform not only observation of an electronic image but observation of an external world image is known (for example, refer to JP,2-281891,A and JP,4-26289,A).

[0003]
The example of a configuration of the optical system of the see-through mold FMD is shown in drawing 9 . In drawing 9 , incidence is carried out to the concave surface half mirror 16 which has arranged the display light from the electronic image of the 2-dimensional graphic display component 11 arranged out of a visual field to the method of impending through lenses 14 and 15. Thereby, widening of the reflex of the electronic image is carried out by the concave surface half mirror 16, and it is led to an eye. Moreover, the liquid crystal shutter 10 is arranged ahead of the concave surface half mirror 16. Therefore, if the liquid crystal shutter 10 is changed into a protection-from-light condition, an electronic image is observable, and if it changes into a transparency condition, an external world image is observable. In addition, which type may be used although there are POJITAIPU which will be in a protection-from-light condition at the time of electrical-potential-difference impression, and NEGATAIPU which will be in a transparency condition at the time of electrical-potential-difference impression as a liquid crystal shutter 10.
[0004]
drawing 10 -- see-through one -- it is drawing showing the example of the appearance of the whole FMD, and the see-through carbon button 2 for switching the transparency condition and protection-from-light condition of the liquid crystal shutter 10 to a left lateral is formed in the position of the FMD body 1, and drawing.
[0005]
And such a see-through mold FMD is used in passenger means, such as an aircraft, for a user's amusement, and is beginning to be used also in an educational field etc.
[0006]
[Problem(s) to be Solved by the Device]
However, in the graphic display system using the conventional see-through mold FMD, since only the observer performed control of whether a liquid crystal shutter is changed into a transparency condition, or to change into a protection-from-light condition, there were the following problems.
[0007]
For example, since considering the case where the graphic display system using the see-through mold FMD is used for a passenger transport it is necessary to tell the purport from which it will take off from now on at the time of a takeoff to the observer who is observing the electronic image, to display compulsorily the electronic image of "since it takes off, please fasten a seat belt", for example is desired. The same is said of the time of landing. Moreover, when the situation of requiring emergency occurs, in order to make it cope with it suitable for the emergency concerned to the observer who is observing the electronic image, it will be necessary to make an external world image observe.
[0008]

Moreover, considering the case where the graphic display system using the see-through mold FMD is used for an educational place, it is necessary to make all participants observe a blackboard etc. and to change compulsorily the liquid crystal shutter of the see-through mold FMD into a transparency condition in such a case. Furthermore, since a certain problem is given to all participants, it is necessary to make the electronic image in question observe compulsorily to all the members in such a case.

[0009]

thus, when applying the graphic display system using the see-through mold FMD to a public place, or in using it by two or more persons Although those who have the superintendent's etc. authority will need to make all observers observe an external world image compulsorily or will need to make the predetermined electronic image observe compulsorily Since only the observer did selection of whether a liquid crystal shutter is changed into a transparency condition in the conventional see-through mold FMD, or to change into a protection-from-light condition, the above requests cannot be met.

[0010]

This design solves the above-mentioned technical problem, and in the graphic display system using the see-through mold FMD, a predetermined electronic image is made to observe compulsorily, or it aims at offering the graphic display system by which third persons other than the observer who is using the see-through mold FMD can make an external world image observe compulsorily to an observer to an observer.

[0011]

[Means for Solving the Problem]

In order to attain the above-mentioned purpose, the graphic display system of this design The graphic display device equipped with the optical system which projects the image displayed on the graphic display component which displays an image, and said graphic display component at least on an observer's eyeball, The image switch means which switches the image which it is prepared in said graphic display device and one, or another object, and is led to said observer's eyeball, The first image switch means control unit with which the first signal which is formed in said graphic display device and one, or another object, and controls said image switch means was made as an output is possible, With said graphic display device, it is characterized by the ability to be prepared in another object, to have the second image switch means control unit made as an output of the second signal which controls said image switch means is possible, and not to be based on said first signal, but control said image switch means by said second signal compulsorily.

[0012]

Here, said image switch means may be an external world image switch means which switches induction/cutoff of the external world image led to said observer's eyeball like according to claim 2,

and may be an image switch means which switches the image according to claim 3 displayed on said graphic display component like.

[0013]

[Function]

Although the first image switch means control unit may be formed in the position of a graphic display device, and it prepares in another object with a graphic display device and ******** is also good, if this 1st image switch means control unit is operated, an image switch means will be controlled, and the image observed by this switches. Here, an image names generically these not only including an electronic image but an external world image. Therefore, by operating this first image switch means control unit, an observer can also observe an external world image and can also observe a desired electronic image.

[0014]

Furthermore, the graphic display system of this design is equipped with the second image switch means control unit.

The graphic display device is formed by another object and this second image switch means control unit can control an image switch means compulsorily. Therefore, an external world image can be made to observe compulsorily to an observer, and a predetermined electronic image can be made to observe by operating this second image switch means control unit.

[0015]

[Example]

Hereafter, an example is explained, referring to a drawing. In addition, in the following examples, it is called see-through ON to make the liquid crystal shutter of the see-through mold FMD into a transparency condition, and it is called see-through OFF to make a liquid crystal shutter into a protection-from-light condition.

[0016]

Drawing 1 is drawing showing the configuration of the 1st example of the graphic display system concerning this design.

This example is drawing showing the example of a configuration which enabled it to control whether the liquid crystal shutter of see-through ON / off control 1 (FMD is only called hereafter), i.e., a see-through mold FMD body, is changed into a transparency condition, or it changes into a protection-from-light condition by the image supply unit 20.

[0017]

In drawing 1 , FMD1 is connected with the image supply unit 20 by the cable 21, and a video signal, a power source, a see-through control signal, etc. are supplied from the image supply unit 20 to FMD1. In addition, 22 shows a connector. Moreover, although only one see-through mold FMD1 is connected to the image supply unit 20 in drawing 1 , naturally more than one may be carried out.

[0018]

The see-through carbon button 2 is arranged at FMD1, if an observer operates this see-through carbon button 2 as usual and makes it see-through OFF, the electronic image supplied from the image supply unit 20 is observable, and if it is made see-through ON, an external world image is observable.

[0019] Although not illustrated, if it has the switch which can be set up and makes it see-through ON whether FMD1 is considered as see-through ON at the image supply unit 20, or it considers as see-through OFF with the switch concerned, a see-through control signal will be supplied to FMD1. And when the see-through control signal from the image supply unit 20 shows see-through OFF, and an observer operates the see-through carbon button 2 to the FMD1 side, control of see-through ON / OFF is possible, but when the see-through control signal from the image supply unit 20 shows see-through ON, FMD1 is compulsorily made with see-through ON, and is made as [make / even if it operates the see-through carbon button 2 / it / see-through OFF].

[0020]

Therefore, the operator who operates the image supply unit 20 can make all FMD(s)1 see-through ON, and can make all observers observe an external world image by this by operating the switch concerned.

[0021]

Moreover, also when a power source is not supplied from the image supply unit 20, it is made as [serve as / FMD1 / see-through ON].

[0022]

Here, as shown, for example in drawing 2 A, in see-through OFF, in the signal of a low level, and see-through ON, it can also consider as the clock signal of a predetermined frequency, and although the gestalt of a see-through control signal is arbitrary, as shown in drawing 2 B, in see-through OFF, in the signal of a low level, and see-through ON, it can also consider as a high-level signal.

[0023]

Such see-through ON/OFF control can be performed by forming a liquid crystal shutter control unit as shown in the see-through mold FMD1 at drawing 3 as what controls the transparency condition / protection-from-light condition of a liquid crystal shutter. In drawing 3 the see-through control signal detecting circuit 23 Predetermined level when the see-through control signal from the image supply unit 20 is detected and it is see-through ON, For example, other predetermined level when a high-level signal is outputted and it is see-through OFF, For example, a low level is outputted, when a see-through control signal is what is shown in drawing 2 A, it can constitute from a circuit which detects the frequency of a clock signal, and when a see-through control signal is what is shown in drawing 2 B, it can constitute from a level detector etc.

[0024]

Although the output of this see-through control signal detecting circuit 23 is inputted into the liquid crystal shutter control circuit 24, the signal from the supply voltage supplied to the liquid crystal shutter control circuit 24 from the image supply unit 20 and the see-through carbon button 2 is inputted. And the liquid crystal shutter control circuit 24 detects supply voltage, and when supply voltage is a normal value and the output of the see-through control signal detecting circuit 23 is a low level, and the signal from the see-through carbon button 2 was confirmed, a predetermined electrical potential difference is impressed to a liquid crystal shutter when made with see-through ON with the see-through carbon button 2 and it is made with see-through OFF, it impresses other predetermined electrical potential differences. For example, when the thing of POJITAIPU shall be now used as a liquid crystal shutter, in see-through ON, the liquid crystal shutter control circuit 24 is. 0V are impressed and, in see-through OFF, it is. The predetermined electrical potential difference which is not 0V is impressed.

[0025]

Moreover, when supply voltage is a normal value, and the output of the see-through control signal detecting circuit 23 is high-level, the liquid crystal shutter control circuit 24 disregards the signal from the see-through carbon button 2, and impresses the electrical potential difference made into a transparency condition to a liquid crystal shutter.

[0026]

Furthermore, when the level of supply voltage is detected and supply voltage is not supplied, the liquid crystal shutter control circuit 24 disregards the signal from the output and the see-through carbon button 2 of the see-through control signal detecting circuit 23, and impresses the electrical potential difference made into a transparency condition to a liquid crystal shutter.

By the above configuration, FMD1 can be compulsorily considered as see-through ON from the outside by operating the image supply unit 20.

[0027]

Next, the 2nd example is explained.

Although drawing 4 is drawing showing the configuration of the 2nd example of this design and the image supply unit 25 supplies a video signal, a see-through control signal, etc., these signals are transmitted by wireless from an antenna 26. In the FMD1 side, an antenna 27 receives the signal by which wireless transmission was carried out.

[0028]

As shown in drawing 5 A and B here, he is trying for a see-through control signal to change see-through ON and see-through OFF in the level of the predetermined level period of the vertical-retrace-line period of a video signal, although wireless transmission of the signal as shown in drawing 2 A and B may naturally be carried out on a predetermined frequency. In addition, in drawing 5 , H shows a Horizontal Synchronizing signal and CB shows a color burst signal.

[0029]

Therefore, FMD1 can be compulsorily considered as see-through ON from the outside, and an observer can be made to observe an external world image by operating the image supply unit 25 by forming a liquid crystal shutter control unit as shown in drawing 6 in FMD1.

[0030]

The predetermined level period of the vertical-retrace-line period of the video signal which received the see-through control signal detecting circuit 27 in drawing 6 is sampled, the level is detected, what shows see-through ON, and the thing which shows see-through OFF is judged, in being see-through ON, it outputs predetermined level, for example, a high-level signal, and in being see-through OFF, it outputs other predetermined level, for example, a low level.

[0031]

Although the output of this see-through control signal detecting circuit 27 is inputted into the liquid crystal shutter control circuit 28, the signal from the see-through carbon button 2 is inputted into the liquid crystal shutter control circuit 28. And when the output of the see-through control signal detecting circuit 27 is a low level, the liquid crystal shutter control circuit 28 confirms the signal from the see-through carbon button 2, when made with see-through ON with the see-through carbon button 2, it impresses the electrical potential difference made into a transparency condition to a liquid crystal shutter, and when made with see-through OFF, it impresses the electrical potential difference made into a protection-from-light condition.

[0032]

Moreover, when the output of the see-through control signal detecting circuit 27 is high-level, the liquid crystal shutter control circuit 28 disregards the signal from the see-through carbon button 2, and impresses the electrical potential difference made into a transparency condition to a liquid crystal shutter.

[0033]

Next, the 3rd example of this design is explained.

Drawing 7 is drawing showing the configuration of the 3rd example of this design, it has FMD1, the 1st control device 30, and the 2nd control device 29, and FMD1 and the 1st control device 30 are connected by the cable 33, and the 1st control device 30 and the 2nd control device 29 are connected by the cable 34.

[0034]

The 1st control device 30 is not arranged to the observer who uses FMD1, and although not illustrated to the see-through carbon button 31 and drawing 7 , it is equipped with the channel switch means for switching the program of a volume control means and an electronic image etc.

[0035]

Therefore, an observer considers FMD1 as see-through OFF with the see-through carbon button 31,

can operate the 1st control unit 30, can observe a desired electronic image, and can hear the voice of the electronic image concerned with desired sound volume by the earphone 32. Moreover, an external world image is observable by considering as see-through ON with the see-through carbon button 31.

[0036]

The 2nd control unit 29 controls the 1st control unit 30, and is operated by predetermined operators other than an observer while it supplies various video signals, a see-through control signal, etc.

[0037]

And the switch for transmitting the see-through control signal for controlling see-through ON/OFF of FMD1 to the 2nd control unit 29, although not illustrated to drawing 7 And the switch for supplying a predetermined electronic image to FMD1 compulsorily (It is hereafter called the 1st switch) It has (it is hereafter called the 2nd switch), and if the see-through control signal which the 1st switch of the 2nd control device 29 is operated, and shows see-through ON is transmitted, the see-through carbon button 31 of the 1st control device 30 will be made with an invalid, and FMD1 will be compulsorily made with see-through ON. When shown in the 1st control unit 30 at drawing 3 , the see-through control signal at this time should just prepare the same liquid crystal shutter control circuit, so that it may be drawing 2 A or drawing 2 B.

[0038]

Moreover, if the 2nd switch of the 2nd control device 29 is operated, while a predetermined video signal will be supplied to a specific channel, a predetermined control signal is transmitted. The 1st control device 30 sets sound volume as predetermined magnitude while switching it to the specific channel concerned, if this control signal is detected. A predetermined electronic image can be made to observe with predetermined sound volume by this to all observers that are using FMD1. In order to perform such control, since such a circuit is common knowledge, detailed explanation is omitted that what is necessary is just to have the switch circuit which performs a channel switch to the 1st control device 30 based on the output of the detecting circuit and detecting circuit which detect the control signal concerned.

[0039]

In addition, when FMD1 is made by see-through ON, the electronic image concerned cannot be made to observe, although a predetermined electronic image can be made to observe compulsorily according to the above-mentioned configuration when FMD1 is made at see-through OFF. Then, the predetermined control signal transmitted when the 2nd switch is operated may be detected, and the control unit which makes FMD1 see-through OFF compulsorily based on it may be formed in the 1st control unit 30. When such a control unit is shown in drawing 3 , it is in ** that it can constitute similarly at this contractor.

[0040]

Next, the 4th example of this design is explained.
It has FMD1, the 1st control unit 36, the 2nd control unit 35, and switch equipment 37, and it switches with FMD1, and drawing 8 is drawing showing the configuration of the 4th example of this design, and switch equipment 37, and the 1st control unit 36 and the 2nd control unit 35 are connected [equipment 37 is connected by the cable 40 and] by cables 38 and 39, respectively.
[0041]
The 1st control unit 36 supplies various video signals, and the 2nd control unit 35 supplies control signals including a specific video signal and a specific see-through control signal etc. Moreover, it is for choosing whether switch equipment 37 is supplied from the 1st control unit 36 to FMD1, or it supplies from the 2nd control unit 35, and is operated by predetermined operators other than an observer.
[0042]
Switch equipment 37 is usually made as [choose / the 1st control unit 36]. Therefore, by considering FMD1 as see-through OFF with the see-through carbon button 2, an observer can observe an electronic image and can hear the voice of the electronic image concerned by the earphone 32. Moreover, an external world image is observable by considering as see-through ON with the see-through carbon button 2.
[0043]
An operator chooses the 2nd control unit 35 as all observers with switch equipment 37 to observe a specific electronic image compulsorily while supplying the specific video signal concerned from the 2nd control unit 35. The electronic image by the video signal supplied from the 2nd control unit 35 is displayed on FMD1 by this. In addition, at this time, with having described the 3rd example of the above, similarly, a predetermined control signal may be supplied with a specific video signal, and FMD1 may be compulsorily made see-through OFF.
[0044]
Moreover, the 2nd control unit 35 is made as it is possible to send out a see-through control signal. Therefore, an operator chooses the 2nd control unit 35 with switch equipment 37 while sending out a see-through control signal from the 2nd control unit 35. Since all FMD(s)1 are compulsorily made with see-through ON by this, all observers can be made to observe an external world image by it.
[0045]
As mentioned above, although the example of this design was explained, this design is not limited to the above-mentioned example, and it is in ** for various deformation to be possible at this contractor.
[0046]
[Effect of the Device]
According to this design, all FMD(s) are made see-through ON if needed, and all observers can be made to be able to observe an external world image, or can be made to observe a specific electronic

image so that clearly from the above explanation.

PRIOR ART

[Description of the Prior Art]

Conventionally, the see-through mold FMD which can perform not only observation of an electronic image but observation of an external world image is known (for example, refer to JP,2-281891,A and JP,4-26289,A).

[0003]

The example of a configuration of the optical system of the see-through mold FMD is shown in drawing 9 . In drawing 9 , incidence is carried out to the concave surface half mirror 16 which has arranged the display light from the electronic image of the 2-dimensional graphic display component 11 arranged out of a visual field to the method of impending through lenses 14 and 15. Thereby, widening of the reflex of the electronic image is carried out by the concave surface half mirror 16, and it is led to an eye. Moreover, the liquid crystal shutter 10 is arranged ahead of the concave surface half mirror 16. Therefore, if the liquid crystal shutter 10 is changed into a protection-from-light condition, an electronic image is observable, and if it changes into a transparency condition, an external world image is observable. In addition, which type may be used although there are POJITAIPU which will be in a protection-from-light condition at the time of electrical-potential-difference impression, and NEGATAIPU which will be in a transparency condition at the time of electrical-potential-difference impression as a liquid crystal shutter 10.

[0004]

drawing 10 -- see-through one -- it is drawing showing the example of the appearance of the whole FMD, and the see-through carbon button 2 for switching the transparency condition and protection-from-light condition of the liquid crystal shutter 10 to a left lateral is formed in the position of the FMD body 1, and drawing.

[0005]

And such a see-through mold FMD is used in passenger means, such as an aircraft, for a user's amusement, and is beginning to be used also in an educational field etc.

EFFECT OF THE INVENTION

[Effect of the Device]

According to this design, all FMD(s) are made see-through ON if needed, and all observers can be made to be able to observe an external world image, or can be made to observe a specific electronic image so that clearly from the above explanation.

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Device]

However, in the graphic display system using the conventional see-through mold FMD, since only the observer performed control of whether a liquid crystal shutter is changed into a transparency condition, or to change into a protection-from-light condition, there were the following problems.

[0007]

For example, since considering the case where the graphic display system using the see-through mold FMD is used for a passenger transport it is necessary to tell the purport from which it will take off from now on at the time of a takeoff to the observer who is observing the electronic image, to display compulsorily the electronic image of "since it takes off, please fasten a seat belt", for example is desired. The same is said of the time of landing. Moreover, when the situation of requiring emergency occurs, in order to make it cope with it suitable for the emergency concerned to the observer who is observing the electronic image, it will be necessary to make an external world image observe.

[0008]

Moreover, considering the case where the graphic display system using the see-through mold FMD is used for an educational place, it is necessary to make all participants observe a blackboard etc. and to change compulsorily the liquid crystal shutter of the see-through mold FMD into a transparency condition in such a case. Furthermore, since a certain problem is given to all participants, it is necessary to make the electronic image in question observe compulsorily to all the members in such a case.

[0009]

thus, when applying the graphic display system using the see-through mold FMD to a public place, or in using it by two or more persons Although those who have the superintendent's etc. authority will need to make all observers observe an external world image compulsorily or will need to make the predetermined electronic image observe compulsorily Since only the observer did selection of whether a liquid crystal shutter is changed into a transparency condition in the conventional see-through mold FMD, or to change into a protection-from-light condition, the above requests cannot be met.

[0010]

This design solves the above-mentioned technical problem, and in the graphic display system using the see-through mold FMD, a predetermined electronic image is made to observe compulsorily, or it aims at offering the graphic display system by which third persons other than the observer who is using the see-through mold FMD can make an external world image observe compulsorily to an observer to an observer.

MEANS

[Means for Solving the Problem]

In order to attain the above-mentioned purpose, the graphic display system of this design The graphic display device equipped with the optical system which projects the image displayed on the graphic display component which displays an image, and said graphic display component at least on an observer's eyeball, The image switch means which switches the image which it is prepared in said graphic display device and one, or another object, and is led to said observer's eyeball, The first image switch means control unit with which the first signal which is formed in said graphic display device and one, or another object, and controls said image switch means was made as an output is possible, With said graphic display device, it is characterized by the ability to be prepared in another object, to have the second image switch means control unit made as an output of the second signal which controls said image switch means is possible, and not to be based on said first signal, but control said image switch means by said second signal compulsorily.

[0012]

Here, said image switch means may be an external world image switch means which switches induction/cutoff of the external world image led to said observer's eyeball like according to claim 2, and may be an image switch means which switches the image according to claim 3 displayed on said graphic display component like.

OPERATION

[Function]

Although the first image switch means control unit may be formed in the position of a graphic display device, and it prepares in another object with a graphic display device and ******** is also good, if this 1st image switch means control unit is operated, an image switch means will be controlled, and the image observed by this switches. Here, an image names generically these not only including an electronic image but an external world image. Therefore, by operating this first image switch means control unit, an observer can also observe an external world image and can also observe a desired electronic image.

[0014]

Furthermore, the graphic display system of this design is equipped with the second image switch means control unit.

The graphic display device is formed by another object and this second image switch means control unit can control an image switch means compulsorily. Therefore, an external world image can be made to observe compulsorily to an observer, and a predetermined electronic image can be made to observe by operating this second image switch means control unit.

EXAMPLE

[Example]

Hereafter, an example is explained, referring to a drawing. In addition, in the following examples, it is called see-through ON to make the liquid crystal shutter of the see-through mold FMD into a transparency condition, and it is called see-through OFF to make a liquid crystal shutter into a protection-from-light condition.

[0016]

Drawing 1 is drawing showing the configuration of the 1st example of the graphic display system concerning this design.

This example is drawing showing the example of a configuration which enabled it to control whether the liquid crystal shutter of see-through ON / off control 1 (FMD is only called hereafter), i.e., a see-through mold FMD body, is changed into a transparency condition, or it changes into a protection-from-light condition by the image supply unit 20.

[0017]

In drawing 1 , FMD1 is connected with the image supply unit 20 by the cable 21, and a video signal, a power source, a see-through control signal, etc. are supplied from the image supply unit 20 to FMD1. In addition, 22 shows a connector. Moreover, although only one see-through mold FMD1 is connected to the image supply unit 20 in drawing 1 , naturally more than one may be carried out.

[0018]

The see-through carbon button 2 is arranged at FMD1, if an observer operates this see-through carbon button 2 as usual and makes it see-through OFF, the electronic image supplied from the image supply unit 20 is observable, and if it is made see-through ON, an external world image is observable.

[0019]

Although not illustrated, if it has the switch which can be set up and makes it see-through ON whether FMD1 is considered as see-through ON at the image supply unit 20, or it considers as see-through OFF with the switch concerned, a see-through control signal will be supplied to FMD1. And when the see-through control signal from the image supply unit 20 shows see-through OFF, and an observer operates the see-through carbon button 2 to the FMD1 side, control of see-through ON / OFF is possible, but when the see-through control signal from the image supply unit 20 shows see-through ON, FMD1 is compulsorily made with see-through ON, and is made as [make / even if it operates the see-through carbon button 2 / it / see-through OFF].

[0020]

Therefore, the operator who operates the image supply unit 20 can make all FMD(s)1 see-through ON, and can make all observers observe an external world image by this by operating the switch

concerned.

[0021]

Moreover, also when a power source is not supplied from the image supply unit 20, it is made as [serve as / FMD1 / see-through ON].

[0022]

Here, as shown, for example in drawing 2 A, in see-through OFF, in the signal of a low level, and see-through ON, it can also consider as the clock signal of a predetermined frequency, and although the gestalt of a see-through control signal is arbitrary, as shown in drawing 2 B, in see-through OFF, in the signal of a low level, and see-through ON, it can also consider as a high-level signal.

[0023]

Such see-through ON/OFF control can be performed by forming a liquid crystal shutter control unit as shown in the see-through mold FMD1 at drawing 3 as what controls the transparency condition / protection-from-light condition of a liquid crystal shutter. In drawing 3 the see-through control signal detecting circuit 23 Predetermined level when the see-through control signal from the image supply unit 20 is detected and it is see-through ON, For example, other predetermined level when a high-level signal is outputted and it is see-through OFF, For example, a low level is outputted, when a see-through control signal is what is shown in drawing 2 A, it can constitute from a circuit which detects the frequency of a clock signal, and when a see-through control signal is what is shown in drawing 2 B, it can constitute from a level detector etc.

[0024]

Although the output of this see-through control signal detecting circuit 23 is inputted into the liquid crystal shutter control circuit 24, the signal from the supply voltage supplied to the liquid crystal shutter control circuit 24 from the image supply unit 20 and the see-through carbon button 2 is inputted. And the liquid crystal shutter control circuit 24 detects supply voltage, and when supply voltage is a normal value and the output of the see-through control signal detecting circuit 23 is a low level, and the signal from the see-through carbon button 2 was confirmed, a predetermined electrical potential difference is impressed to a liquid crystal shutter when made with see-through ON with the see-through carbon button 2 and it is made with see-through OFF, it impresses other predetermined electrical potential differences. For example, when the thing of POJITAIPU shall be now used as a liquid crystal shutter, in see-through ON, the liquid crystal shutter control circuit 24 is. 0V are impressed and, in see-through OFF, it is. The predetermined electrical potential difference which is not 0V is impressed.

[0025]

Moreover, when supply voltage is a normal value, and the output of the see-through control signal detecting circuit 23 is high-level, the liquid crystal shutter control circuit 24 disregards the signal from the see-through carbon button 2, and impresses the electrical potential difference made into a

transparency condition to a liquid crystal shutter.

[0026]

Furthermore, when the level of supply voltage is detected and supply voltage is not supplied, the liquid crystal shutter control circuit 24 disregards the signal from the output and the see-through carbon button 2 of the see-through control signal detecting circuit 23, and impresses the electrical potential difference made into a transparency condition to a liquid crystal shutter.

By the above configuration, FMD1 can be compulsorily considered as see-through ON from the outside by operating the image supply unit 20.

[0027]

Next, the 2nd example is explained.

Although drawing 4 is drawing showing the configuration of the 2nd example of this design and the image supply unit 25 supplies a video signal, a see-through control signal, etc., these signals are transmitted by wireless from an antenna 26. In the FMD1 side, an antenna 27 receives the signal by which wireless transmission was carried out.

[0028]

As shown in drawing 5 A and B here, he is trying for a see-through control signal to change see-through ON and see-through OFF in the level of the predetermined level period of the vertical-retrace-line period of a video signal, although wireless transmission of the signal as shown in drawing 2 A and B may naturally be carried out on a predetermined frequency. In addition, in drawing 5 , H shows a Horizontal Synchronizing signal and CB shows a color burst signal.

[0029]

Therefore, FMD1 can be compulsorily considered as see-through ON from the outside, and an observer can be made to observe an external world image by operating the image supply unit 25 by forming a liquid crystal shutter control unit as shown in drawing 6 in FMD1.

[0030]

The predetermined level period of the vertical-retrace-line period of the video signal which received the see-through control signal detecting circuit 27 in drawing 6 is sampled, the level is detected, what shows see-through ON, and the thing which shows see-through OFF is judged, in being see-through ON, it outputs predetermined level, for example, a high-level signal, and in being see-through OFF, it outputs other predetermined level, for example, a low level.

[0031]

Although the output of this see-through control signal detecting circuit 27 is inputted into the liquid crystal shutter control circuit 28, the signal from the see-through carbon button 2 is inputted into the liquid crystal shutter control circuit 28. And when the output of the see-through control signal detecting circuit 27 is a low level, the liquid crystal shutter control circuit 28 confirms the signal from the see-through carbon button 2, when made with see-through ON with the see-through carbon

button 2, it impresses the electrical potential difference made into a transparency condition to a liquid crystal shutter, and when made with see-through OFF, it impresses the electrical potential difference made into a protection-from-light condition.

[0032]

Moreover, when the output of the see-through control signal detecting circuit 27 is high-level, the liquid crystal shutter control circuit 28 disregards the signal from the see-through carbon button 2, and impresses the electrical potential difference made into a transparency condition to a liquid crystal shutter.

[0033]

Next, the 3rd example of this design is explained.

Drawing 7 is drawing showing the configuration of the 3rd example of this design, it has FMD1, the 1st control device 30, and the 2nd control device 29, and FMD1 and the 1st control device 30 are connected by the cable 33, and the 1st control device 30 and the 2nd control device 29 are connected by the cable 34.

[0034]

The 1st control device 30 is not arranged to the observer who uses FMD1, and although not illustrated to the see-through carbon button 31 and drawing 7 , it is equipped with the channel switch means for switching the program of a volume control means and an electronic image etc.

[0035]

Therefore, an observer considers FMD1 as see-through OFF with the see-through carbon button 31, can operate the 1st control unit 30, can observe a desired electronic image, and can hear the voice of the electronic image concerned with desired sound volume by the earphone 32. Moreover, an external world image is observable by considering as see-through ON with the see-through carbon button 31.

[0036]

The 2nd control unit 29 controls the 1st control unit 30, and is operated by predetermined operators other than an observer while it supplies various video signals, a see-through control signal, etc.

[0037]

And the switch for transmitting the see-through control signal for controlling see-through ON/OFF of FMD1 to the 2nd control unit 29, although not illustrated to drawing 7 And the switch for supplying a predetermined electronic image to FMD1 compulsorily (It is hereafter called the 1st switch) It has (it is hereafter called the 2nd switch), and if the see-through control signal which the 1st switch of the 2nd control device 29 is operated, and shows see-through ON is transmitted, the see-through carbon button 31 of the 1st control device 30 will be made with an invalid, and FMD1 will be compulsorily made with see-through ON. When shown in the 1st control unit 30 at drawing 3 , the see-through control signal at this time should just prepare the same liquid crystal shutter

control circuit, so that it may be drawing 2 A or drawing 2 B.

[0038]

Moreover, if the 2nd switch of the 2nd control device 29 is operated, while a predetermined video signal will be supplied to a specific channel, a predetermined control signal is transmitted. The 1st control device 30 sets sound volume as predetermined magnitude while switching it to the specific channel concerned, if this control signal is detected. A predetermined electronic image can be made to observe with predetermined sound volume by this to all observers that are using FMD1. In order to perform such control, since such a circuit is common knowledge, detailed explanation is omitted that what is necessary is just to have the switch circuit which performs a channel switch to the 1st control device 30 based on the output of the detecting circuit and detecting circuit which detect the control signal concerned.

[0039]

In addition, when FMD1 is made by see-through ON, the electronic image concerned cannot be made to observe, although a predetermined electronic image can be made to observe compulsorily according to the above-mentioned configuration when FMD1 is made at see-through OFF. Then, the predetermined control signal transmitted when the 2nd switch is operated may be detected, and the control unit which makes FMD1 see-through OFF compulsorily based on it may be formed in the 1st control unit 30. When such a control unit is shown in drawing 3 , it is in ** that it can constitute similarly at this contractor.

[0040]

Next, the 4th example of this design is explained.

It has FMD1, the 1st control unit 36, the 2nd control unit 35, and switch equipment 37, and it switches with FMD1, and drawing 8 is drawing showing the configuration of the 4th example of this design, and switch equipment 37, and the 1st control unit 36 and the 2nd control unit 35 are connected [equipment 37 is connected by the cable 40 and] by cables 38 and 39, respectively.

[0041]

The 1st control unit 36 supplies various video signals, and the 2nd control unit 35 supplies control signals including a specific video signal and a specific see-through control signal etc. Moreover, it is for choosing whether switch equipment 37 is supplied from the 1st control unit 36 to FMD1, or it supplies from the 2nd control unit 35, and is operated by predetermined operators other than an observer.

[0042]

Switch equipment 37 is usually made as [choose / the 1st control unit 36]. Therefore, by considering FMD1 as see-through OFF with the see-through carbon button 2, an observer can observe an electronic image and can hear the voice of the electronic image concerned by the earphone 32. Moreover, an external world image is observable by considering as see-through ON

with the see-through carbon button 2.

[0043]

An operator chooses the 2nd control unit 35 as all observers with switch equipment 37 to observe a specific electronic image compulsorily while supplying the specific video signal concerned from the 2nd control unit 35. The electronic image by the video signal supplied from the 2nd control unit 35 is displayed on FMD1 by this. In addition, at this time, with having described the 3rd example of the above, similarly, a predetermined control signal may be supplied with a specific video signal, and FMD1 may be compulsorily made see-through OFF.

[0044]

Moreover, the 2nd control unit 35 is made as it is possible to send out a see-through control signal. Therefore, an operator chooses the 2nd control unit 35 with switch equipment 37 while sending out a see-through control signal from the 2nd control unit 35. Since all FMD(s)1 are compulsorily made with see-through ON by this, all observers can be made to observe an external world image by it.

[0045]

As mentioned above, although the example of this design was explained, this design is not limited to the above-mentioned example, and it is in ** for various deformation to be possible at this contractor.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is drawing showing the configuration of the 1st example of this design.

[Drawing 2] It is drawing showing the example of the gestalt of the see-through control signal used in the 1st example.

[Drawing 3] It is drawing showing the example of a configuration of a liquid crystal shutter control unit prepared in FMD.

[Drawing 4] It is drawing showing the configuration of the 2nd example of this design.

[Drawing 5] It is drawing showing the example of the gestalt of the see-through control signal used in the 2nd example.

[Drawing 6] It is drawing showing the example of a configuration of the liquid crystal shutter control unit used in the 2nd example.

[Drawing 7] It is drawing showing the configuration of the 3rd example of this design.

[Drawing 8] It is drawing showing the configuration of the 4th example of this design.

[Drawing 9] It is drawing showing the example of a configuration of the optical system of the see-through mold FMD.

[Drawing 10] It is drawing showing the example of the appearance of the see-through whole FMD.

[Description of Notations]

1 -- See-through mold FMD body

2 31 -- See-through carbon button

10 -- Liquid crystal shutter

11 -- Graphic display component

14 15 -- Lens

16 -- Concave surface half mirror

20 25 -- Image supply unit

21, 33, 34, 38, 39, 40 -- Cable

22 -- Connector

23 27 -- See-through control signal detecting circuit

24 28 -- Liquid crystal shutter control circuit

26 27 -- Antenna

29 35 -- The 2nd control unit

30 36 -- The 1st control unit

32 -- Earphone

37 -- Switch equipment